CERTIFIED AGGREGATE PRODUCER PROGRAM AUDIT CHECKLIST

Date _____ Page ___ of ___

Source No. _____ **Q No**. _____

Plant/Redistribution Terminal Name _____

Plant/Redistribution Terminal Location _____

District Testing Engineer or _____

INDOT Audit Team Members

	Name	Position
1.	_____	Geologist
2.	_____	Area Supervisor
3.	_____	Aggregate Technician
4.	_____	_____
5.	_____	_____
6.	_____	_____
7.	_____	_____

Plant/Redistribution Terminal Members

	Name	Position
1.	_____	Certified Aggregate Technician
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____

1. GENERAL INSTRUCTIONS

DTE

Certified Aggregate Producer Program (CAPP)
Quality Control Plan (QCP)
Certified Aggregate Technician (CAT)

Any square bracket marked by an X on the Audit Checklist requires a Corrective Action Sheet to be prepared. The Corrective Action Sheet will be prepared when a deficiency is found, and a copy given to the Producer by the end of the audit. All other square brackets shall have a check, if the item is satisfactory, or NA if not applicable.

Begin the audit by having all INDOT audit members review the QCP before arriving at the Producer's site. Likewise, checklists prepared during previous audits, especially the last one, will be reviewed. All members of the audit team should compare revision dates of each page to verify that their QCP includes all current addenda.

A listing of applicable INDOT documents and Indiana Test Methods are maintained in the CAPP Document List. The current revision date for each publication is provided in the list.

1.1 [ ] Area Supervisor or _____ has listing of documents

The Addenda Summary Sheet and QCP Annex are required to be maintained in the QCP Appendix. Items on these two sheets should be reviewed and the Producer instructed that the necessary addenda for these items be submitted at the close-out meeting.

1.2 [ ]* Addenda Summary Sheet and QCP Annex reviewed

* Only if applicable

2. PRODUCTION FLOW DIAGRAM

ITM 211 Reference 14.2.10

Geologist or _____

2.1 [ ] The Annual Aggregate Source Report for Stone Producers represents conditions found at source and as required by ITM 203

Review the diary and note locations where material has been extracted.

2.2 [ ] Locations noted in diary match areas that have been mined as shown on grid in the Annual Aggregate Source Report

Begin at the origin of the material, which is the quarry or the pit. Inspect the site and view the entire process tracing all information shown on the QCP flow diagram. Also, note any discrepancies of the production process with that shown or described in the QCP. End at the point of shipment.

The Producer will be reviewed for any deviations in the ledge processing or changes in the plant, including crushers, washers, bins, belt routes, screen combinations, delivery and off loading processes, etc. Specific details, such as manufacturers names, screen sizes, dimensions, etc., are not required on the flow diagram..

2.3 [ ] Plant in accordance with QCP
2.4 [ ] Changes noted in diary

Identify all material stockpiles and bins within Producer's yard.

2.5 [ ]* All stockpiles and bins have signs indicated in QCP
2.6 [ ]* Stockpile map is current and located as indicated in QCP
2.7 [ ] All material stockpiles and bins are listed as materials or otherwise accounted for in QCP
2.8 [ ]* Air-cooled blast furnace slag stockpiles designated for leachate testing are approximately 2000 tons
2.9 [ ]* Steel furnace slag stockpiles designated for deleterious testing are approximately 2000 tons

The QCP will cover any other process control techniques that will be used beyond the minimums established by INDOT specifications and policies.

2.10 [ ]* Other process control techniques are as defined in QCP

* Only if occurs

3. QUALITY CLASSIFICATIONS ITM 211 References

14.2.3
14.2.4
14.2.8

Geologist or _____

A list and description of all portions of the mineral deposits indicating the different quality classes as described in ITM 203, ITM 205, and ITM 210 will be provided in the QCP. The manner in which each quality class is processed, handled and stockpiled will be covered.

3.1 [ ] Each quality class is processed, handled and stockpiled in accordance with the QCP

An explanation for each product having marginal quality characteristics and the plans or controls to be used for such products shall be provided in the QCP.

3.2 [ ]* Each marginal quality class material is processed, handled and stockpiled in accordance with QCP

* Only If Producer has materials with marginal quality characteristics

4. MATERIALS ITM 211 References

3.10
5.2

Geologist or _____

If the Producer is a Redistribution Terminal, prior source documentation of a material obtained from another aggregate source shall be provided by the Producer.

4.1 [ ] Quality satisfactory as verified by being from a Certified Producer and a Certified Material, or traced to original INDOT approved source

The list of Certified Materials for the Producer shall be compared with the materials indicated in the QCP and the materials on site for Department use.

4.2 [ ] The list of Certified Materials is in accordance with the QCP.

If the source has yet to be CAPP approved, a list of products, ledges, if applicable, and source code numbers will be tabulated and included with the Audit Checklist

5. PRODUCER GENERAL INFORMATION

ITM 211 References
5.1
5.2
14.2.1

Area Supervisor or _____

5.1 [ ] Plant location and address in QCP is correct
5.2 [ ] Plant telephone and FAX numbers in QCP are correct
5.3 [ ] Producers name and address in QCP are correct and ownership has not changed
5.4 [ ] Producers telephone and FAX numbers in QCP are correct
5.5 [ ] Key personnel contact information in QCP is correct. (Management Rep and CAT mobile numbers and email address.)
5.6 [ ] Type of Producer (plant, redistribution terminal, or plant & redistribution terminal) identified in QCP is correct

6. PRODUCER PERSONNEL

ITM 211 References
6.1
6.2
14.2.2

Area Supervisor or _____

The Producer employees occupy the following positions.

6.1 [ ] Management Representative
6.2 [ ] CAT(s)
6.3 [ ] Appointed CAT(s) Certification has not expired
6.4 [ ] All personnel conducting sampling and testing for the CAPP are Qualified Technicians

7. DOCUMENTS

ITM 211 References
2.5, 17.3

Area Supervisor or _____

Determine whether the following documents are current and on file at the Producer's site or location indicated in QCP. Check the CAPP Document List for the most current dates of these items.

7.1 [ ]* INDOT Certified Aggregate Producer Program (ITM 211)
7.2 [ ]* INDOT Standard Specification (Includes Supplemental Specifications sections 211, 301, 302, 303, 904 and 917)
7.3 [ ]* INDOT Inspection and Sampling Procedure for Fine And Coarse Aggregates
7.4 [ ]* Indiana Quality Assurance Certified Aggregate Technician Training Manual for Producer Technicians
7.5 [ ] Summary of Production Quality Test Results Letter, Summary of Ledge Quality Letter, and the AP Aggregate Approval Letter for all applicable materials produced at the Plant
7.6 [ ]* All applicable INDOT, AASHTO, and ASTM Test Methods **referenced in QCP**. The documents are in accordance with the CAPP Document List.

ITM 206 _____	AASHTO T 2 _____
ITM 207 _____	AASHTO T 11 _____
ITM 212 _____	AASHTO T 27 _____
ITM 219 _____	AASHTO T 84 _____
ITM 902 _____	AASHTO T 85 _____
ITM 906 _____	AASHTO T 112 _____
ITM 910 _____	AASHTO T 248 _____
_____	ASTM D 4791 _____
_____	ASTM D 5821 _____
_____	_____

* May be maintained electronically or by hard copies.

Obtain weigh tickets for an active period of one week that represent material shipped for Department use. Check for accuracy and minimum requirements as follows:

7.7 [ ] Q number listed and is correct
7.8 [ ] Originating source name listed and is correct
7.9 [ ] Source number listed and is correct
7.10 [ ] Aggregate size listed
7.11 [ ] Ledges listed for stone product and they are correct

8. CONTROL CHARTS ITM 211 Reference
Area Supervisor or _____ 13.0
ALL CONTROL CHARTS

8.1 [ ] All materials identified as products in the QCP have a control chart which is posted (critical sieve or all sieves charted as required by CAPP)
8.2 [ ] Aggregate sizes are clearly shown on the charts
8.3 [ ] Control charts are maintained as indicated in the QCP
8.4 [ ] Control charts are generated electronically
8.5 [ ] Control charts are hand plotted

*Check the **critical sieve** material control charts for compliance with the QCP and ITM 211. Production and load-out charts (if load-out tests are plotted on a separate chart) are required to be checked.*

Target Mean
8.6 [ ] Values are the same as indicated in QCP
8.7 [ ] Numerically identified in left margin of charts or in accordance with QCP and indicated to the first decimal place (0.0)
8.8 [ ] Heavy long, then short dashed line or in accordance with QCP

Control Limits
8.9 [ ] Upper and lower control limits are the same as indicated in QCP
8.10 [ ] Numerically identified in left margin of charts or in accordance with QCP and indicated to the first decimal place (0.0) or whole number (0)

***Critical sieve** materials that have not obtained a minimum of 10 normal production tests are required to have the specification limits plotted for all sieves. For these materials, check the following:*

Specification Limits
8.11 [ ] Upper and lower limits indicated on all sieves
8.12 [ ] Values are the same as Section 904 for Standard Specification materials or as indicated in the QCP for QA materials
8.13 [ ] Short dashed lines or as indicated in QCP
8.14 [ ] Numerically identified in left margin or in accordance with QCP

*Check the **non-critical sieve** material control charts for compliance with the QCP and ITM 211. Production and load-out charts (if load-out tests are plotted on a separate chart) are required to be checked.*

8.15 [ ] Upper and lower limits indicated on all sieves
8.16 [ ] Values are the same as Section 904 for Standard Specification materials or as indicated in the QCP for QA materials
8.17 [ ] Short dashed lines or as indicated in QCP
8.18 [ ] Numerically identified in left margin or in accordance with QCP

CONTROL CHARTS (continued)

PRODUCTION CONTROL CHARTS WITH CRITICAL SIEVES

*Select one **Production** control chart for a material with a **critical sieve** and check for conformance with the following criteria. Mark the square bracket with a Q for any deviation from the CAPP that is in accordance with the QCP.*

Material selected was: _____

8.19 [ ] Maintained until 30 production points are plotted and the previous 30 points, if applicable, are displayed (Certified Producers only)
8.20 [ ] If in the Trial Phase, charts are maintained since entering into the Trial Phase
8.21 [ ] All charts retained at least 3 years for Certified Producers in CAPP > 3 Years

Production Test Results
8.22 [ ] Point surrounded by small circle and plotted to first decimal place (0.0)
8.23 [ ] Consecutive points connected by solid straight line

Moving Average of 5 Test Values
8.24 [ ] Point surrounded by small triangle
8.25 [ ] Consecutive points connected by solid straight line

Stockpile Load-Out Test Results
8.26 [ ] Production chart
8.27 [ ]* Separate chart
8.28 [ ] Point surrounded by small square

* If separate chart, complete stockpile load-out control chart checklist sheet for material with critical sieve

All Test Results
8.29 [ ] Points plotted left to right in chronological order
8.30 [ ] Test dates shown along horizontal axis

Obtain production test reports and load-out test reports (if plotted on same chart) to check for accuracy in reporting and plotting. For hand-plotted charts, check all tests during an active period of one week. For computer generated charts, check two randomly selected tests.

8.31 [ ] All test dates for points plotted on charts are the same as dates reported on test reports and in the daily diary
8.32 [ ] All points are plotted correctly
8.33 [ ] Five point moving average calculated and plotted correctly for two randomly selected points

INCLUDE THIS SHEET ONLY IF STOCKPILE LOAD-OUT IS PLOTTED ON SEPARATE CHART

CONTROL CHARTS (continued)

LOAD-OUT CONTROL CHARTS WITH CRITICAL SIEVES

*Select one stockpile **Load-Out** control chart for a material with a **critical sieve** and check for conformance with the following criteria.*

Material selected was: _____

8.34 [ ] Maintained until 30 points are plotted and the previous 30 points, if applicable, are displayed (Certified Producers only)
8.35 [ ] If in the Trial Phase, charts are maintained since entering into the Trial Phase
8.36 [ ] All charts retained at least 3 years for Certified Producers in CAPP > 3 Years

Stockpile Load-Out Test Results

8.37 [ ] Points surrounded by small squares and plotted to first decimal place (0.0)
8.38 [ ] Consecutive points connected by solid straight line

All Test Results

8.39 [ ] Points plotted left to right in chronological order
8.40 [ ] Test dates shown along horizontal axis

Obtain load-out test reports to check for accuracy in reporting and plotting. For hand-plotted charts, check all tests during an active period of one week. For computer generated charts, check two randomly selected tests.

8.41 [ ] All test dates for points plotted on charts are the same as dates reported on test reports and in the daily diary
8.42 [ ] All points are plotted correctly

CONTROL CHARTS (continued)

PRODUCTION CONTROL CHARTS WITH NO CRITICAL SIEVES

*Select one **Production** control chart for a material with **no critical sieve** and check for conformance with the following criteria. Mark the square bracket with a Q for any deviation from the CAPP that is in accordance with the QCP.*

Material with selected was: _____

8.43 [ ] Maintained until 30 production points are plotted and the previous 30 points, if applicable, are displayed (Certified Producers only)
8.44 [ ] If in the Trial Phase, charts are maintained since entering into the Trial Phase
8.45 [ ] All charts retained at least 3 years for Certified Producers in CAPP > 3 Years

Production Test Results

8.46 [ ] Point surrounded by small circle and plotted to first decimal place (0.0)
8.47 [ ] Consecutive points connected by solid straight line

Stockpile Load-Out Test Results

8.48 [ ] Production chart
8.49 [ ]* Separate chart
8.50 [ ] Point surrounded by small square

* If separate chart, complete stockpile load-out control chart checklist sheet for material with all sieves

All Test Results

8.51 [ ] Points plotted left to right in chronological order
8.52 [ ] Test dates shown along horizontal axis

Obtain production test reports and load-out test reports (if plotted on same chart) to check for accuracy in reporting and plotting. For hand-plotted charts, check all tests during an active period of one week. For computer generated charts, check two randomly selected tests.

8.53 [ ] All test dates for points plotted on charts are the same as dates reported on test reports and in the daily diary
8.54 [ ] All points are plotted correctly

INCLUDE THIS SHEET ONLY IF STOCKPILE LOAD-OUT IS PLOTTED ON SEPARATE CHART

CONTROL CHARTS (continued)

LOAD-OUT CHARTS WITH NO CRITICAL SIEVES
*Select one **Load-Out** control chart for a material with **no critical sieve** and requiring all sieves to be plotted.*

Material selected was: _____

8.55 [ ] Maintained until 30 points are plotted and the previous 30 points, if applicable, are displayed (Certified Producers only)
8.56 [ ] If in the Trial Phase, charts are maintained since entering into the Trial Phase
8.57 [ ] All charts retained at least 3 years for Certified Producers in CAPP > 3 years

Stockpile Load-Out Test Results

8.58 [ ] Point surrounded by small square and plotted to first decimal place (0.0)
8.59 [ ] Consecutive points connected by solid straight line

All Test Results

8.60 [ ] Point plotted left to right in chronological order
8.61 [ ] Test dates shown along horizontal axis

Obtain load-out test reports to check for accuracy in reporting and plotting. For hand-plotted charts, check all tests during an active period of one week. For computer generated charts, check two randomly selected tests.

8.62 [ ] All test dates for points plotted on charts are the same as dates reported on test reports and in the daily diary
8.63 [ ] All points are plotted correctly

COMPLIANCE RATE

Review the 30 most recent normal production tests in the current and previous year that are charted for each Standard Specification or Quality Assurance product controlled by a critical sieve. If 30 tests are not available, the number of tests taken shall be used with at least 10 tests required. For hand-plotted charts, calculate the test compliance rate using the Compliance Rate Worksheet for all materials. For computer generated charts, check the compliance rate for all materials and calculate the compliance rate for one material using the Compliance Rate Worksheet.

8.64 [ ] Compliance rate ≥ 95% for each material

8.65 [ ] *Compliance rate is < 95% and $\sigma \leq 5.0$ for a material (The target mean is required to be adjusted by a QCP Annex)

8.66 [ ] *Compliance is < 95% and $\sigma > 5.0$ for a material. (The stockpile is required to be designated as a non-Certified material)

**If the number of tests is less than 30, additional testing is required before the target mean is adjusted or the material is designated as a non-Certified material. An additional compliance rate check on the material is required after five additional tests have been taken.*

9. DIARY

ITM 211 References
10.0, 12.5, 12.7

Area Supervisor or _____

Select at random one active production month for review of the diary. The diary shall be in accordance with the following requirements, except where "only if occurs" is noted

Month Selected: _____

9.1 [ ] Electronic and/or hard copy

9.2 [ ] One page for each day that there is a material related operation

9.3 [ ] General weather conditions

9.4 [ ] Areas of mining operation - ledges or pit area

9.5 [ ] Materials produced and estimated quantities

9.6 [ ] Materials sampled and tested

9.7 [ ] Time samples were obtained and tests completed (may state that all samples obtained were tested the same day)

9.8 [ ]** Changes in key personnel

9.9 [ ]** Significant changes in equipment, plant, screens, etc

9.10 [ ]** Significant events or problems

9.11 [ ]** Nonconforming trend in 5-point moving average of control chart (7 or more points in a row are above or below target mean, or 7 or more points in a row are increasing or decreasing)

9.12 [ ] Signature by CAT or other persons signature counter-signed by CAT

Any nonconforming normal production or load-out test shall be followed immediately by appropriate action. Search control charts for nonconforming tests. If nonconforming tests are found, review the diary on the date of each test for notations regarding action taken.

9.13 [ ] Nonconforming tests are noted in diary

9.14 [ ] Corrective action was taken

9.15 [ ]** After the second consecutive nonconforming normal production test, notations indicate that the material was isolated

9.16 [ ]** After the second consecutive nonconforming load-out test, notations indicate that shipping from the stockpile was stopped

** Only if occurs

10. SAMPLING AND TESTING ITM 211 References 11.0, 14.2.6, 14.2.7, 14.2.8

Area Supervisor or _____

*The method of recording the quantities of materials **produced** at the Plant per day or time period will be identified in the QCP. Select an active one month period at random from this record. Obtain all production test reports for materials produced during the one month period. Perform calculations as needed and compare the quantities produced against the production test reports, thereby determining the demonstrated frequency of testing. The previous or subsequent monthly record may need to be obtained to verify the frequency of tests.*

10.1 [ ] Start of production frequency is in accordance with QCP, but is not less than once every 1000 t for the first 5000 t (except not required to exceed 2 per day)
10.2 [ ] Normal frequency is in accordance with QCP, but is not less than once every 2000 t (except not required to exceed 2 per day)

*The method of recording the quantities of materials produced at the Plant that are **shipped** per day or time period will be identified in the QCP. Select an active one month period at random from this record. Obtain all load-out test reports for materials shipped during the one month period. Perform calculations as needed and compare the quantities of materials shipped against the load-out test reports, thereby determining the demonstrated frequency of testing. The previous or subsequent monthly record may need to be obtained to verify the frequency of tests.*

10.3 [ ] Load-out frequency is in accordance with QCP, but is not less than once every 8000 t or at least one sample and test performed per month for shipments that exceed 1000 t for each Certified Material
10.4 [ ] All load-out samples for Standard Specifications and Quality Assurance aggregates were decanted and tests are within requirements

If material is obtained from another Certified Producer and is a Certified Material, then load-out tests are required. If the material is obtained from a non-Certified Producer or is not a Certified Material, then the start of production, normal production and load-out tests are required. Search the records for these materials, if applicable, and verify that the required tests have been conducted.

10.5 [ ] Load-out test conducted for Certified Material from another Producer
10.6 [ ] Start of production, normal production and load-out tests conducted for material that is not Certified and is received from another Producer

The Producer shall check coarse aggregates for deleterious materials. Select an active week randomly from the record for quantities of materials made and note all coarse aggregates produced. Find production test reports for that week and search for deleterious test results.

10.7 [ ] Start of production and normal production frequency is in accordance with QCP, but is not less than once per week for each size of Certified Material. (no test is required if the week's production is less than 100 t)
10.8 [ ] Tests are within requirements

SAMPLING AND TESTING (continued)

Select randomly three production test reports and two load-out test reports for any one product and check all calculations performed on the sheets. If test reports are electronic, check calculations on one production test report and one load-out test report.

Indicate type of Report; Electronic Reports: _____ Hand Calculated Reports:_____

10.9 [ ] Calculations on all sheets are correct and rounded to the nearest first decimal place (0.0) (crushed particle content values shall be rounded to the nearest whole number (0))

DECANTATION (AASHTO T 11)

$$\% \text{ Decant} = \frac{\text{Original Dry Weight - Dry Weight after Decant}}{\text{Original Dry Weight}} \times 100$$

GRADATION (AASHTO T 27)

$$\% \text{ Passing} = \frac{\text{Weight Passing Each Sieve}}{\text{Original Dry Sample Weight}} \times 100$$

CLAY LUMPS and FRIABLE PARTICLES (AASHTO T 112)

$$\% \text{ Clay or Friable} = \frac{\text{Dry Wt. of Sample - Dry Wt. Retained (Wet Sieving)}}{\text{Dry Wt. of Sample}} \times 100$$

NON-DURABLE MATERIALS (ITM 206)

$$\% \text{ Non-Durable} = \frac{\text{Weight of Non-Durable Matl. above 3/8 in. Sieve}}{\text{Weight of Sample above 3/8 in. Sieve}} \times 100$$

CHERT

For aggregate sizes 2 through 8, 43, 53, and 73:

$$\% \text{ Total Chert} = \frac{\text{Weight of Chert above the 3/8 in. Sieve}}{\text{Total Weight of Sample above the 3/8 in. Sieve}} \times 100$$

For aggregate sizes 9, 11, 12, and 91:

$$\% \text{ Total Chert} = \frac{\text{Weight of Chert above the No. 4 Sieve}}{\text{Total Weight of Sample above the No. 4 Sieve}} \times 100$$

CRUSHED PARTICLES (ASTM D 5821)

$$\% \text{ Crushed} = \frac{\text{Weight of Crushed Particles}}{\text{Weight of Crushed Particles + Weight of Uncrushed Particles}} \times 100$$

SAMPLING AND TESTING (continued)

Gravel shall be sampled and tested for the percentage of crushed coarse aggregate particles unless the QCP states otherwise. Select a week randomly from the record for quantities of products made, and note all coarse aggregates produced. Find the production test reports for that week and search for crushed particle test results.

10.10 [ ] Start of production and normal production frequency is in accordance with QCP, but is not less than once per week for each size of Certified Material. (no test is required if the week's production is less than 100 t)
10.11 [ ] Tests are within requirements for one and two face fractured particles

Air-Cooled Blast Furnace Slag, except for use in HMA or PCC, shall be sampled and tested for leachate in accordance with ITM 212. Select an active month randomly from the record for quantities made, and verify the frequency of testing.

10.12 [ ] The frequency of testing is in accordance with QCP, but is not less than once for each stockpile of approximately 2000 t
10.13 [ ] Tests are within requirements

Steel Furnace Slag shall be sampled and tested for determination of bulk specific gravity when this material is used in SMA mixtures. Select an active month of production of the steel slag and verify the frequency of testing and compliance with the specification requirements.

10.14 [ ] The frequency of testing is in accordance with QCP, but is not less than once every 2000 t.
10.15 [ ] Individual test results are within 0.050 of the target bulk specific gravity
10.16 [ ] The moving average of four consecutive test results is within 0.040 of the target bulk specific gravity

Steel Furnace Slag shall be sampled and tested for determination of deleterious when this material is used in HMA Base and Intermediate mixtures. Select an active month of production of the steel slag and verify the frequency of testing and compliance with the specification requirements.

10.17 [ ] The frequency of testing is in accordance with QCP, but is not less than once every 2000 t.
10.18 [ ] Individual test results are less than 4.0 % (Stockpiles not meeting this acceptance criteria may be tested again after 30 days from the test date)

SAMPLING AND TESTING (continued)

Source # ___ ___ ___ ___ Page ___ of ___

Composite stockpiling of natural sand fine aggregate from multiple sources into one stockpile may be done provided the fine aggregate is within a range of 0.10 for the bulk specific gravity (dry) and 1.0 % for the absorption for all of the contributing sources. Select an active month of composite stockpiling from the monthly summary reports, and verify the test results are within the bulk specific gravity (dry) and absorption requirements.

10.19 [ ] Bulk specific gravity (dry) test results of all contributing sources are within a range of 0.10.

10.20 [ ] Absorption test results of all contributing sources are within a range of 1.0%

Additional required testing as specified in source's QCP. Select an active month of production and verify the frequency is in accordance with the QCP. Type of test _____

10.21 [ ] Testing frequency meets the requirements of the QCP

10.22 [ ] Test results are in specification

10.23 [ ] Test results outside the specification are handled in accordance with the QCP.

11. PRODUCER YARDS ITM 211 Reference 5.1

Area Supervisor or _____

If a source has Producer Yards, separate load-out charts are required to be maintained for the materials at these locations. Obtain the load-out charts and check the following:

11.1 [ ] All certified materials have a load-out chart

11.2 [ ] Aggregate sizes are clearly shown on the charts

11.3 [ ] Target means, control limits, and specification limits for all charts are in accordance with QCP

Obtain load-out test reports for one material during an active period of one week. Find the corresponding control chart and check the following:

11.4 [ ] All test dates have points plotted

11.5 [ ] Points surrounded by small square or in accordance with the QCP and plotted to the first decimal place (0.0)

11.6 [ ] All points plotted correctly

11.7 [ ] Consecutive points connected by solid straight line

Obtain all load-out test reports for materials shipped from the Producer Yard during a one month period. Perform calculations as needed and compare the quantities of materials shipped against the load-out test reports, thereby determining the demonstrated frequency of testing. The previous or subsequent monthly record may need to be obtained to verify the frequency of tests.

11.8 [ ] Load-out frequency is in accordance with QCP, but is not less than once every 8000 t or at least one sample and test performed per month for shipments that exceed 1000 t for each Certified Material

11.9 [ ] All load-out samples for Standard Specification and Quality Assurance aggregates were decanted and tests are within requirements

12. MATERIAL SAMPLES ITM 211 References

11.0
14.2.10
14.2.11
15.7

Aggregate Technician or _____

Standard Specification and Quality Assurance materials under production at the site on the day of the audit will be reviewed by the audit team. At least one production sample of Standard Specification or Quality Assurance material shall be obtained.

The audit team will review the shipment records of the Standard Specification and Quality Assurance materials for the previous 6 months of production. A minimum of 3 load-out samples shall be obtained of the materials with the highest tonnages of shipment. Some producers may have less than 3 load-out samples to obtain.

The samples shall be obtained and split by the CAT. The INDOT audit team member shall be given the Department's portion of the samples and these samples will be tested.

Sampling shall be in accordance with the QCP and the following requirements verified.

12.1 [ ] Sample locations are as described or shown in QCP
12.2 [ ] Devices are as described in QCP
12.3 [ ] Techniques are as described in QCP
12.4 [ ] CAT obtained sample and performed split in accordance with CAPP

The following test results will be determined. A copy of all test reports from both the INDOT audit team member and the CAT will be attached to the audit checklist. The variation of test results will be shown in the remarks section of the INDOT audit team member's report for each material sampled and tested.

Standard Specification or Quality Assurance Materials

12.5 [ ] Producer's gradation is within control limits for critical sieve materials and within Specification Limits for all other sieves
12.6 [ ] Producer's gradation is within Specification Limits or QCP identified limits on all sieves for materials without a critical sieve
12.7 [ ] Producer's decant is within Specification Limits
12.8 [ ] Producer's deleterious content is within Specification Limits
12.9 [ ]* Producer's crushed particles are within Specification requirements
12.10 [ ] Test results variations are within CAPP guidelines

* Gravel Producers and Redistribution Terminal Producers handling gravel materials

13. LABORATORY ITM 211 References
8.0
9.0

Aggregate Technician or _____

The laboratory will be inspected for compliance with the QCP.

13.1 [ ] Location as described and/or shown in QCP
13.2 [ ] Facility acceptable for testing of materials
13.3 [ ] All equipment listed in QCP at laboratory
13.4 [ ] All equipment apparently in good working order

Check the testing equipment verification records to verify that the documentation includes the following:

1. Description of equipment including Model or Serial Number, if applicable.
2. Name of person performing verification
3. Identification of verification equipment, if applicable
4. Date of verification and next due date
5. Reference of procedure used
6. Verification results

DATE CALIBRATED/VERIFIED

13.5 [ ] Balance(s) -- 12 mo. _____
13.6 [ ] Weights used, Min. Class 3 -- 12 mo. _____
13.7 [ ] Mechanical Shaker(s) -- 12 mo. _____
13.8 [ ] Sieves -- 12 mo. _____

14. AUDIT CLOSE-OUT

DTE or Area Supervisor

When all the results from the audit have been accumulated, including Audit Checklist pages, INDOT test reports, Producer test reports, all Compliance rate worksheets, Corrective Action Sheet(s), and other documentation as may be appropriate, the District Testing Engineer and/or Area Supervisor shall review the documents to verify that they are prepared properly and are complete.

The Audit Close-Out meeting with the Producer will be conducted within 10 working days from the date of the audit. The District Testing Engineer and/or Area Supervisor will arrange and conduct the meeting with the Producer. The results of the audit will be discussed and all outstanding matters will be completely resolved, or solutions with deadlines will be established. Any addenda required by items listed on the Addenda Summary Sheet, QCP Annex, or Corrective Action Sheets shall be submitted at this time.

Upon completion of the Audit Close-Out meeting, all documents will be sent to the Geologist Supervisor, Office of Materials Management.

_____ _____

DTE/Area Supervisor Signature Date

CAPP GRADATION WORKSHEET

SAMPLE ID_____ DATE SAMPLED _____

SAMPLE TYPE- PRODUCTION____LOADOUT_____RERESAMPLE_____INFO_____

MATERIAL SIZE _____

SOURCE_____ Q_____ LEDGES _____

AASHTO T-27 SIEVE SIZE		LONG GR.WT. RETAINED	WEIGHT RETAINED	WEIGHT PASSING	INDOT % PASSING	PROD % PASSING	% DIFF	Tolerance (ITM 211)	PERCENT REQUIRED
2.5	63							5%	
2	50							5%	
1.5	37.5							5%	
1	25							5%	
3/4	19							5%	
1/2	12.5							5%	
3/8	9.5	PF-						5%	
4	4.75							3% *	
8	2.36							3% *	
16	1.18								
30	600								
50	300								
100	150								
200	75							0.5 or 1.0%	
PAN			*** The Maximum % difference for #43, #53 and #73 is 5%**						
		ORIGINAL	FINAL	GM LOSS	% LOSS				
DECANT								0.5 or 1.0%	
GRAMS LOST								<0.3	
LONG GRADED MATERIAL									
MINUS #4		SAMP SIZE	PROP. F						
TOTAL CHERT									
3/8" & UP		WEIGHT	INDOT %	PROD %				40% of the lowest value or 1%	
NON DURABLE									
3/8" & UP		WEIGHT	INDOT %	PROD %					
CRUSHED PARTICLES									
FACE	#4 & UP	CRUSHED	INDOT %	PROD %					
1								5%	
2								5%	

REMARKS:

TESTER SIGNATURE_____ TEST DATE _____

COMPLIANCE RATE WORKSHEET
(Critical Sieve Only)

SC # _____

Product _____ Critical Sieve _____ QCP Target Mean _____

Record the most recent 30 normal production sample test results.

_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Calculate the following Statistics:

$\bar{x}$ = _____ σ_{n-1} = _____

$$Z_{max} = \frac{(\text{QCP Target Mean} + 10) - \bar{x}}{\sigma}$$

= _____ = _____

Z_{max} Area of Probability = _____* x 100 = _____

$$Z_{min} = \frac{\bar{x} - (\text{QCP Target Mean} - 10)}{\sigma}$$

= _____ = _____

Z_{min} Area of Probability = _____* x 100 = _____

% Compliance Σ = _____
(Whole No.)

* From Area of Probability Table

AREA OF PROBABILITY TABLE
FOR BOTH SPECIFICATIONS >0% AND <100%

When the z values to each limit are known, this table will indicate the area of probability between limits where summing the area left of the $\bar{x}$ with the area right of the $\bar{x}$. The sum of the 2 area factors should be multiplied by 100 to give the percent probability of compliance.

		.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0		0.0000	0.0040	0.0080	0.0120	0.0159	0.0199	0.0239	0.0279	0.0319	0.0359
0.1		0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2		0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3		0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4		0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5		0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6		0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2518	0.2549
0.7		0.2580	0.2612	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8		0.2881	0.2910	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9		0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0		0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1		0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2		0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3		0.4032	0.4049	0.4066	0.4083	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4		0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5		0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4430	0.4441
1.6		0.4452	0.4463	0.4474	0.4485	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7		0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8		0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9		0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4758	0.4762	0.4767
2.0		0.4773	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1		0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2		0.4861	0.4865	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3		0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4		0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5		0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6		0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7		0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8		0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4980	0.4980	0.4981
2.9		0.4981	0.4982	0.4983	0.4984	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0		0.4986	0.4987	0.4987	0.4988	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990
3.1		0.4990	0.4991	0.4991	0.4991	0.4992	0.4992	0.4992	0.4992	0.4993	0.4993
3.2		0.4993									
3.3		0.4995									
3.4		0.4997									

EXAMPLE
COMPLIANCE RATE WORKSHEET
(Critical Sieve Only)

SC # **2799**

Product **#8 Stone** Critical Sieve **12.5 mm** QCP Target Mean **52.2**

Record the most recent 30 normal production sample test results.

55.5	49.4	50.3	56.1	53.6	54.6
51.2	46.0	49.5	59.1	52.6	58.1
53.2	42.4	50.8	55.6	52.1	56.4
56.4	53.1	50.5	53.8	61.3	50.9
54.2	65.7	55.2	52.8	49.7	48.1

Calculate the following Statistics:

$\bar{x}$ = **53.3** σ_{n-1} = **4.53**

$$Z_{max} = \frac{(\text{QCP Target Mean} + 10) - \bar{x}}{\sigma}$$

$$= \frac{(52.2 + 10) - 53.3}{4.53} = 1.96$$

Z_{max} Area of Probability = **.4750** * x 100 = **47.50**

$$Z_{min} = \frac{\bar{x} - (\text{QCP Target Mean} - 10)}{\sigma}$$

$$= \frac{53.3 - (52.2 - 10)}{4.53} = 2.45$$

Z_{min} Area of Probability = **.4929** * x 100 = **49.29**

% Compliance Σ = **97**
(Whole No.)

* From Area of Probability Table

CORRECTIVE ACTION SHEET

SOURCE # ___ ___ ___ ___

DATE _____

ITEM _____

Problem Explanation: _____

_____

_____

_____

_____

_____

_____

Corrective Action To Be Taken Is : _____

_____

_____

_____

_____

_____

_____

Deadline Date Is : _____

Follow-up **Date** _____

Finding: _____

_____

_____

_____

If NOT corrected, prepare another Corrective Action Sheet .